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CORRESPONDENCE

Isolation of *Escherichia coli* harboring bla_{NDM-5} from fresh fish in India

Dear Editor

Extended spectrum β-lactamase (ESBL)-producing Gram-negative bacteria have become a severe challenge to chemotherapy.[1] The ESBLs are classified into several groups, the prominent of them being TEM, SHV, and CTX-M types. Members of the family Enterobacteriaceae, which cause diverse infections ranging from wound infection to meningitis, are the major ESBL-producing Gram-negative bacteria. Carbapenems are the antibiotics of choice against ESBL-producing bacteria, but the occurrence of carbapenem-resistant enterobacteria (CRE) producing plasmid-encoded metallo-β-lactamases with carbapenemase activity have emerged worldwide.[2]

In 2008, a new β-lactamase, the New Delhi metallo-β-lactamase (bla_{NDM-1}), capable of hydrolyzing all β-lactams with the exception of aztreonam, was identified in *Klebsiella pneumoniae* isolated from a Swedish patient who was previously treated in India.[3] Subsequently, the NDM-1 producing enterobacteria were isolated from different parts of the world. Studies from India and other countries have reported the occurrence of bla_{NDM-1} harboring bacteria in the environment.[4,5] Variants of NDM-1 designated as NDM-2, NDM-4, NDM-5, NDM-6, and NDM-7 have arisen through point mutations.[6] NDM genes are located on a large plasmid which also harbors resistance genes for several antibiotics such as β-lactams, aminoglycosides, sulfonamides, chloramphenicol, and macrolides and this plasmid is highly mobile leading to its rapid dissemination in the environment.[7] Here, we report the isolation of an NDM-5 harboring *Escherichia coli* from fresh seafood sold in a retail market of Mumbai, India.

We investigated the presence of NDM-producing enterobacteria in fresh seafood samples sold in retail markets of Mumbai. A total of 19 samples, which included 14 finfish and five shellfish samples, were analyzed. The bacterial isolations were made on MacConkey agar following enrichment of the sample in enterobacteria enrichment broth (EE broth and Mossel; Hi Media, Mumbai, India). Presumptive screening for ESBL production was done on HiChrome ESBL agar (Hi Media). The antibiotic susceptibility testing was done using standard antibiotic disks. One isolate, *E. coli* (EC-114), from a fresh Dhoma fish (*Otolithes cuvieri*) collected from a retail fish vendor, was resistant to cephalosporins (cefotaxime, cefoxitin, ceftriaxone, ceftazidime, and cefepime), fluoroquinolones (ciprofloxacin and levofloxacillin), carbapenems (ertapenem, imipenem, and meropenem), but sensitive to aminoglycosides (gentamycin, kanamycin, neomycin, and amikacin), colistin, polymyxin B, and nitrofurantoin. The carbapenemase activity was detected by the combined disk diffusion method using imipenem-EDTA discs. The minimum inhibitory concentrations (MICs) were determined for eight antibiotics using MIC strips (Hi-Media). The isolate was resistant to cephalosporins (MICs of cefotaxime, ceftazidime, and cefepime $>$ 256 μg/mL), carbapenems (MICs of imipenem, meropenem and ertapenem $>$ 32 μg/mL), piperacillin/tazobactam (MIC $>$ 256 μg/mL), and ciprofloxacin (MIC $>$ 256 μg/mL), but sensitive to colistin (MIC $=$1.5 μg/mL). The bla_{NDM-1} gene-specific polymerase chain reaction (PCR) was used to detect the NDM gene followed by amplification and sequencing of the full length bla_{NDM} gene.[8] Comparison of the predicted amino acid sequence with NDM-1 and NDM-2 identified two amino acid substitutions at positions 88 (Val-Leu) and 154 (Met-Leu), as reported previously.[9] PCR screening of EC-114 for additional ESBL genes detected the presence of SHV, TEM, CTX-1, CTX-25, and OXA-1 types. The NDM-5 sequence has been deposited in the GenBank under the accession number (KJ576638).

The incidence of bla_{NDM-5} harboring *E. coli* in seafood is worrisome and suggests definite risk of wound infections to seafood handlers and person to person transmission. Cross contamination of other foods with NDM^{+} bacteria by seafood can also occur. It is important to identify the points of postharvest contamination of fresh seafood to prevent the dissemination of multidrug resistant bacteria through seafood.

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Conflicts of interest

The authors declare that they have no conflicts of interest related to the material discussed in this article.

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